

**TITLE:** ANALYSIS OF THE CORRELATION BETWEEN THE PRESENCE OF GENES ENCODING HEMOLYSINS AND THEIR CYTOTOXIC ABILITY TO OBTAIN FROM *Morganella morganii*, FROM URINARY TRACT SURVEYS ACQUIRED IN THE COMMUNITY OF LONDRINA-PR, BRAZIL

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**ABSTRACT:**

*Morganella morganii* is an opportunistic Gram negative enterobacterium belonging to the Proteaeae tribe, together with bacteria of the genus *Proteus* and *Providencia*. Despite belonging to a normal microbiota, it is capable of causing a wide variety of clinical infections in the community, especially those associated with urinary tract infections (UTI). Hemolysins are toxins that have cytotoxic activity, capable of forming pores in cell membranes, causing their lysis. The presence of hemolysins is an important bacterial virulence factor in infections. Thus, the present study sought to associate the bacterial cytotoxicity capacity with the presence of genes related to hemolysis capacity in 70 *M. morganii* isolates from community urinary tract infections, in the city of Londrina-PR, isolated in a period of 2016-2020. For the cytotoxicity assay, we obtained, from bacterial culture in broth, the supernatant centrifuged and filtered on Durapore<sup>TM</sup> membranes with 0.22 µm pores, preventing the passage of bacteria. 96-well plates with Vero cell monolayer were used for testing. At a 1:10 dilution in DMEM, the supernatant was inoculated onto the plates, which were incubated for 72 hours. After this period, MTT was added to verify the percentage of viable cells, based on the absorbance analysis. To verify the presence of genes associated with hemolysis, the polymerase chain reaction (PCR) was performed for the genes *hlyA* and *shlA*. The results obtained showed that 24 (34.28%) isolates showed high cytotoxicity in tests with Vero cells, demonstrating a high rate of cell death. The results obtained molecularly showed the presence of the *hlyA* gene in 12 (17.14%) and the *shlA* gene in 25 (37.14%) of the isolates, of which 4 (5.71%) presented both genes concomitantly and 33 (47.14) isolates with at least one of them. Interestingly, the isolates that presented the two genes investigated at the same time, had a higher rate of cytotoxicity compared to the isolates that presented only one of the genes, or none at all. It is therefore concluded that the presence of genes that have hemolysins as products in *M. morganii* are highly related to cytotoxicity in epithelial cells. Thus, the presence of hemolysins in UTI isolates from the community is closely linked to their cytotoxicity capacity, thus favoring their pathogenicity.

**KEYWORDS:** Cytotoxic, Community, *Morganella morganii*, UTI, virulence

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